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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/573,469	01/19/2007	Hiroya Kobayashi	46884-5466	9353

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EXAMINER	
DOAN, THERESA T	

ART UNIT	PAPER NUMBER
2814	

MAIL DATE	DELIVERY MODE
11/26/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/573,469	KOBAYASHI ET AL.	
	Examiner	Art Unit	
	Theresa T. Doan	2814	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *03* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 January 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-6* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4 and 6* is/are rejected.

7)☒ Claim(s) *5* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *19 January 2007* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *100708, 092408, 082708, 071508, 020108, 011907*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. Figure 8 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-4 and 6 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Glenn et al. (6,571,466).

Regarding claim 1, Glenn (Fig. 10) discloses a semiconductor device comprising:

a semiconductor substrate 104, having a photodetecting unit 106 formed on one surface (column 8, lines 27-37), a thinned portion, opposing the photodetecting unit 106,

of another surface, and first electrodes 108 disposed on the one surface at an outer edge of the thinned portion and electrically connected to the photodetecting unit 106;

a wiring substrate 1002, disposed to oppose the one surface side of the semiconductor substrate and having second electrodes 110 connected via conductive bumps 112 to the first electrodes 108; and

a resin 116, filling a gap between the wiring substrate and the outer edge of the thinned portion to reinforce the strength of bonding of the respective first electrodes 108 and the respective second electrodes 110 with the conductive bumps 112 (column 10, lines 42-49);

wherein the wiring substrate 1002 has formed therein a groove portion 1006 that surrounds a region opposing the thinned portion and communicating portions that extend from the groove portion 1006 to an exposed surface of the wiring substrate 1002 (column 21, lines 3-18).

As to the grounds of rejection under section 103(a), the method for forming by etching a region is an intermediate process step that does not affect the structure of the final device. See MPEP 2113 which discussed the handling of “product by process” claims and recommends the alternative (102/103) grounds of rejection. Therefore, the process limitation (formed by etching) would not carry patentable weight in this claim drawn to a structure, because distinct structure is not necessarily produced. In re Thorpe, 227 USPQ 964 (Fed. Cir. 1985).

Regarding claim 2, Glenn (Fig. 10) discloses the communicating portions are second groove portions formed on a surface of the wiring substrate 1002 that opposes the semiconductor substrate 104.

Regarding claim 3, Glenn (Fig. 10) discloses wherein the communicating portions are through-holes that pass through the wiring substrate 1002.

Regarding claim 4, Glenn (Fig. 7) discloses the photodetecting unit 106 has a plurality of pixels that are arrayed one-dimensionally.

Regarding claim 6, Glenn discloses wherein a gas is interposed between the thinned portion of the semiconductor substrate 104 and the wiring substrate 1002 (Fig. 2, column 10, lines 50-59).

Double Patenting

4. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington,* 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

5. Claims 1-4 and 6 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-2 of copending Application No. 10/573,468 (U.S. Pub. 2007/0272998) in view of Tomita et al. (7,274,101).

Although the conflicting claims are not identical, they are not patentably distinct from each other because both applications claimed a semiconductor device comprising: a semiconductor substrate, having a photodetecting unit formed on one surface, a thinned portion formed by etching a region, opposing the photodetecting unit. Specifically, regarding claim 1 of instant application, claim 1 of copending application discloses a semiconductor device comprising:

a semiconductor substrate, having a photodetecting unit formed on one surface, a thinned portion formed by etching a region, opposing the photodetecting unit, of another surface, and first electrodes disposed on the one surface at an outer edge of the thinned portion and electrically connected to the photodetecting unit (claim 1, lines 1-7);

a wiring substrate, disposed to oppose the one surface side of the semiconductor substrate and having second electrodes connected via conductive bumps to the first electrodes (claim 1, lines 8-11); and

a resin, filling a gap between the wiring substrate and the outer edge of the thinned portion to reinforce the strength of bonding of the respective first electrodes and the respective second electrodes with the conductive bumps (claim 1, lines 12-16).

The copending Application No. 10/573,468 (U.S. Pub. 2007/0272998) does not claim wherein the wiring substrate has formed therein a groove portion.

However, Tomita (Fig. 5) discloses wherein the wiring substrate 41 has formed therein a groove portion 45b that surrounds a region opposing the thinned portion and communicating portions that extend from the groove portion 45b to an exposed surface of the wiring substrate 41 in order to connect the front side and the back side (column 1, lines 19-20). Accordingly, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to modify the method of Kobayashi by forming the wiring substrate has formed therein a groove portion that surrounds a region opposing the thinned portion and communicating portions that extend from the groove portion to an exposed surface of the wiring substrate in order to make the connection, as taught by Tomita (column 1, lines 19-20).

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented. The facts are that the claims of the instant application and the copending application have claimed the same goal.

Allowable Subject Matter

6. Claim 5 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The prior art of record fails to disclose all the limitations recited in the above claims. Specifically, the prior art of record fails to disclose the wiring substrate has first lead terminals, to which signals that drive the photodetecting unit are provided, and second lead terminals that output detected signals from the photodetecting unit, and among the plurality of second electrodes, those that are connected to the second lead terminals are positioned inside the region surrounded by the groove portion, among the plurality of second electrodes, those that are connected to the first lead terminals are positioned outside the region surrounded by the groove portion.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Theresa T. Doan whose telephone number is (571) 272-1704. The examiner can normally be reached on Monday, Tuesday and Thursday from 7:00AM - 3:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, WAEL FAHMY can be reached on (571) 272-1705. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Theresa T. Doan/
Primary Examiner, Art Unit 2814